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10/084,688	02/27/2002	Lee Chow	UCF-293	6411

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EXAMINER

PADGETT, MARIANNE L

ART UNIT PAPER NUMBER

1762

DATE MAILED: 10/22/2003

5

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/084,688

Applicant(s)

Lee et al

Examiner

M.L. Padgett

Group Art Unit

1762

— The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address —

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- ☒ Responsive to communication(s) filed on 7/10/03
- ☐ This action is **FINAL**.
- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

- ☒ Claim(s) 1-14 is/are pending in the application.
- Of the above claim(s) 7-14 is/are withdrawn from consideration.
- ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- ☒ Claim(s) 1-6 is/are rejected.
- ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- ☐ Claim(s) \_\_\_\_\_ are subject to restriction or election requirement

## Application Papers

- ☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).
- ☐ All ☐ Some\* ☐ None of the:
- ☐ Certified copies of the priority documents have been received.
- ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
- ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

\*Certified copies not received: \_\_\_\_\_

## Attachment(s)

- ☒ Information Disclosure Statement(s), PTO-1449, Paper No(s) 2
- ☒ Notice of Reference(s) Cited, PTO-892
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Interview Summary, PTO-413
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Other \_\_\_\_\_

Office Action Summary

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1. Applicant's election with traverse of Invention I, claims 1-6 in Paper No. 4 is acknowledged. The traversal is on the ground(s) that all 3 inventions may be searched by the same art unit/examiners. This is not found persuasive because the case has been transferred to AU 1762 (427/526) which does only coating processes, but has claims to product classes/subclasses to be examined therein. Even if the original listings of classification 29/592.1, 374/163 and 219/595 were in the same art unit (which they are not), they would still constitute three different searches, looking for different information, hence take more time than is given for examining a single case, hence constituting an undue burden on the examiner.

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 1-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The use of relative terms that lack clear metes and bounds either in the claim, in a well defined definition in the specification or in relevant cited prior art, is vague and indefinite. The claimed terms "nano-scale" and "nano-strip" are such relative terms. The specification was reviewed for definitions, but none were found. Examples were found, or suggestions of possible sizes: (page 2, line 4) "nano size as small as 50 nm"; (page 2, line 11) "submicron and/or nanometer dimensions"; or (page 3, lines 15-18) "nano-strips... on order of approximately 50 nm... crossection. W/Pt junction... 50x50 nm<sup>2</sup>", but these are not proper definitions of the relative terms as required, hence definition or clarification is needed to define the scope of the claims.

In claim 5 "the coating" has no clear antecedent bases, as the term is not consistent with any previous limitations' terminology. While claim 2, from which 5 depends "is partially coated with two separate electrical conductors," indicates the presence of two coatings, claim 5 refers to only one, and is

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not necessarily as written, either of those implied by claim 2. Also, in claim 2, what the relationship of the two electrical conductors is to the 2 metal nano-strips deposited in claim 1, is not defined. They could be those strips or be entirely other features on the substrate.

3. Applicant's IDS is made of record, with Chow appearing to be totally unrelated to the process, and the Majumdar references relating to possibly analogous products, but not using FIB deposition.

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Nishioka et al.

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In Nishioka et al, see the abstract; figures 2, 3 and 4, especially 2C, 3G, 3B, 3E, 4B, 4C and 4G; and corresponding description on column 8-12, especially column 8, line 27-38 and 52-63; column 9, lines 3-6, 25-68 (note use of  $W(CO_3)_6$  or  $Mo(CO_3)_6$  with  $Ga^+$  beam for deposition of W or Mo in sub-micron size patterns); column 10, lines 33-65 and column 12, lines 3-21 and 34-60. Nishioka et al is making an analyzing electrode, which is considered to be a type of sensor, with their "converging ion beam" (i.e. Focused Ion Beam or FIB) deposition techniques, where lines of metal that partially overlap are deposited as claimed. Particularly note the fourth embodiments' FIB deposited metal lines 105 and 6, as well as the third metal film deposit 61, where the first metal line is deposited on insulating coating 2, which may be phosphosilicate glass (PSG; column 6, lines 32-35), thus the substrate for deposition is insulating, such as glass, as claimed.

6. Claim 6 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Nishioka et al.

While Nishioka et al do not discuss whether or not the deposited metal contains any Ga, the ion beam suggested for use in the deposition process is  $Ga^+$ , and hence some gallium would have inherently been present in the metal deposits. Alternately, it would have been obvious to one of ordinary skill in the art, that beam and atmospheric (i.e. gas) conditions adjusted for deposition, rather than for boring would have been expected to deposit some of the metal Ga beam ions by entrapment in the deposit, otherwise sputtering of the deposited material would predominate to prevent significant deposition.

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nishioka et al.

Without knowing how the coating of claim 5 relates to the previously claimed deposits, it is impossible to effectively, determine if "the coating is a film of Al" is obvious or not. However, Nishioka et al may have other metal/conductor films than those of Mo or W deposited by FIB, and aluminum wiring is a commonly used material, so it would have been obvious to one of ordinary skill in the art to

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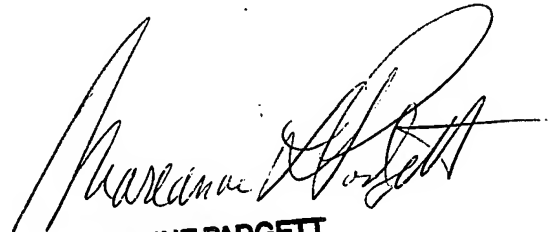
employ Al wiring in any of Nishioka et al's other metal films or wiring layers, since what metal was employed is not disclosed, and use of known materials would have been expected.

8. The patent to Corbin et al is cited as of interest for its background discussion (column 2, line 34- column 5, line 25) of FIB-CVD, particularly noting column 4, lines 41-45, which teach that fine metal lines made by this technique typically contain Ga impurities, hence substantiating above arguments for gallium's presence in the deposits of Nishioka et al.

Other art providing relevant teachings on FIB metal deposition include Kubena et al and Gavish.

9. Any inquiry concerning this communication from the examiner should be directed to M. L. Padgett whose telephone number is (703) 308-2336. The examiner can generally be reached on Monday-Friday from about 8:30 a.m. to 4:30 p.m.; and fax phone numbers are (703) 872-9306 (official); and (703) 305-6078 (unofficial).

M.L. Padgett/dh 10/1/03  
October 2, 2003



**MARIANNE PADGETT  
PRIMARY EXAMINER**